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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/001,676	10/23/2001	Yeong-Taeg Kim	SAM2.0002	3180

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EXAMINER	
YENKE, BRIAN P	
ART UNIT	**PAPER NUMBER**
2614	

DATE MAILED: 11/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/001,676	KIM ET AL.	
	Examiner	Art Unit	
	BRIAN P. YENKE	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,7,10-15,19 and 22* is/are rejected.

7)☒ Claim(s) *4-6,8,9,16-18,20,21 and 23-25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. The examiner previously found applicant's arguments persuasive with respect to the Jiang reference, however upon further review/consultation the examiner will rely on the same reference, by modifying the rejection as shown below. In the event the applicant continues to disagree with the merits of the rejection, the examiner invites the applicant to call the examiner and discuss the case in order to expedite prosecution.

The examiner is relying on the same reference however, the examiner modified the rejection as shown in the rejection of the independent claims, thus the previous arguments are moot.

It is noted by the examiner, that the applicant previously disagreed that Jiang discloses point-wise motion detection signals, the applicant states that the motion metrics are simply pixel luminance value differences. The examiner notes that the fundamental concept of motion detection is the detection of a parameter (whether brightness, chrominance, luminance, contrast or some combination) in order to ascertain if the scene/image has changed or not, thus the indication of motion, if the applicant continues to disagree with this concept, the examiner would like the applicant to clarify how you cannot detect motion utilizing the luminance differences.

Regarding claim 11, applicant states that Jiang's blending factors is not the same as the motion decision value as claimed. The examiner disagrees as stated in the rejection with respect to claim 1, the *motion decision value*... is met by spatial median filter 110 and LUT 11, where the motion metrics computed by motion detector 109 are filtered via spatial median filter 110 and then LUT 111 obtains the weight (blending factor), for frame or field interpolation. LUT

varies the decision value of the motion signals computed by using a blending factor of 1 or 0 as shown on page 3, para 42. Also, as stated by Jiang, if there is motion then field/spatial interpolation is used and if there is no motion frame/temporal interpolation is performed, thus anticipating the pending claims.

Regarding the applicants remarks that the incorporated references aren't combinable. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2a. Claims 1, 2, 10-14 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Jiang et al., US 2002/0027610.

In considering claims 1 and 13,

a) the claimed inputting a video signal... is met by input 101, which are an interlaced video signal (Fig 1).

b) the claimed computing a frame difference signal... is met by pixel difference unit 107, which takes the luminance value differences of pixels in prescribed fields (Fig 3, page 2, Para 23), i.e. C1-C-1 is a frame difference signals which is used in the calculation of the motion metric Δ by taking the absolute value (|C1-(C_1)|) from motion metric C (page 2 para 23).

c) the claimed forming a point-wise motion detection signal... is met by the combination of pixel difference unit 107 and/or motion detection 109 (Fig 1), where difference unit 107 computes the motion metrics, where as shown in Fig 3, can be motion about a point (i.e. Δc, Δn and Δs (page 2, para 22—27). As stated in Jiang the frame difference signal (C1-C-1) is computed, where the absolute value of that computation is the motion at a particular point (i.e. Δc). In addition to computing respective motion at points as done in the pixel difference unit 107, motion detector 109 can detect motion about a point/region utilizing any number of computation from difference unit 107, as shown (para 27-32). In the simplest sense motion metric C (i.e. Δc) will be the point-wise motion detection signal.

d) the claimed computing a region-wise motion detection signal... is met by motion detection 109 (Fig 1), which computes the motion metrics, about a region utilizing the point detected motion (i.e. –a (page 2, para 24, and computing a max/min of the region utilizing the computed motion about a point. Where the frame difference signal (C-C-1), which is used to derive the computed motion metric about a point(i.e. Δc), is now utilized to compute the regional motion metric around a point/region utilizing various motion metrics (i.e. Δ=max((Δc,Δa), which utilizes the frame difference, point detection and an adjacent point detection signal in ascertaining a region detection.

e) the claimed forming from the region-wise motion detection signal a motion decision value... is met by spatial median filter 110 and LUT 11, where the motion metrics computed by motion detector 109 are filtered via spatial median filter 110 and then LUT 111 obtains the weight (blending factor), for frame or field interpolation.

In considering claims 2 and 14,

The claimed low-pass filtering the difference signal prior to the step of forming the point-wise motion detection signal is met by LPF 108 (Fig 1).

In considering claims 10 and 22,

a) the claimed spatially interpolating a value of the video signal... is met by frame interpolator 105 (Fig 1)

b) the claimed temporally interpolating the value of the video signal... is met by field interpolator 106 (Fig 1).

c) the claimed forming a motion decision value... (refer to rejection of claims 1 and 13 above).

d) the claimed mixing an output signal... is met by alpha blender 112 (Fig 1) where the blending of the video signal is based upon the motion value determines the blending of the field and/or frame interpolation (page 3, Para 40-44).

In considering claims 11 and 12,

Jiang discloses that based upon the motion metric value which may take on a value between 0 and 8, is used in determining the blending factor (motion decision value) which varies between 0 and 1 (page 3, Para 42) based on the interpolation methods. As shown in Fig 5, when there is little or no motion (motion metric value = 0-4) the field (temporal) interpolation is used, where there is high or maximum motion (motion metric value = 5-8) the frame (spatial)

interpolation is used. Thus the motion decision value (i.e. blending factor) is varied between 0 and 1 based upon a motion metric value between 0 and 8.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3a. Claims 3 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over, Jiang et al., US 2002/0027610 in view of Taubman, US 6,122,017.

In considering claims 3 and 15,

Regarding the matrix of coefficients for the LPF. Jiang discloses a LPF 108 which is used to smooth the pixel luminance value differences. However, Jiang does not explicitly disclose the LPF being defined by a matrix. Jiang does disclose computing various (Fig 3) pixel luminance value differences in order to determine the motion for each missing pixel and then interpolating the missing lines to create a progressive field (from the interlaced signal).

It is noted by the examiner that a filter, which is defined by a matrix/kernel, is conventional in the art. Since a filter based upon the application, can be weighted (number of taps, coefficients) according to the input (based on position, size, etc) in order to provide a predetermined output.

Based upon applicant's traversal the examiner will incorporate Taubman which discloses the use of a 3 tap horizontal LPF kernel (kernel is synonymous with matrix).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Jiang which discloses a LPF in smoothing out the differences between various differences on pixels in various locations, to utilize a LPF defined by a matrix to filter the respective differences by a predetermined factor (i.e. selected number of taps/coefficients), to provide a smoothed signal based upon it's relevance to the missing pixel.

3b. Claims 7 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over, Jiang et al., US 2002/0027610 in view of Taubman, US 6,122,017 and Gowda et al., US 6,275,259

In considering claims 7 and 19,

Regarding the use of a LPF to filter the region-wise motion detection signal prior to outputting.

Jiang does disclose the use of a LPF 108 (Fig 1), however the combination of Jiang/Taubman does not explicitly disclose the use of a LPF prior to outputting.

However, the use of a filter (LPF), which is used to filter a signal, whether at the input, output or in-between is a matter of design choice, based upon the size of the system, the type/quality of the signal inputted/output and thus bares no patentable weight.

Based upon applicant's previous response, the examiner will incorporate Gowda (col 3, line 10-21) which discloses adding a LPF prior to outputting a signal is optional, thereby supporting the examiner's previous rejection that the addition of a LPF is not a patentable distinct feature, since it is notoriously well known to include LPF throughout a system.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Jiang/Taubman which disclose the use of a conventional kernel (matrix)

LPF and a smoothing filter on the input to remove any unwanted signals/noise, with Gowda by optionally including a LPF at the output, to also remove any unwanted signals/noise which may have attached to the desired signal.

Allowable Subject Matter

4. Claims 4-6, 8,9,16-18, 20-21 and 23-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure—see newly cited references on attached form PTO-892.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Yenke whose telephone number is (571)272-7359. The examiner work schedule is Monday-Thursday, 0730-1830 hrs.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's Supervisor, John W. Miller, can be reached at (571)272-7352.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:

(571)-273-8300

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is

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PAIR (http://pair.uspto.gov) provides customers direct secure access to their own patent application status information, as well as to general patent information publicly available. EFS allows customers to electronically file patent application documents securely via the Internet. EFS is a system for submitting new utility patent applications and pre-grant publication submissions in electronic publication-ready form. EFS includes software to help customers prepare submissions in extensible Markup Language (XML) format and to assemble the various parts of the application as an electronic submission package. EFS also allows the submission of Computer Readable Format (CRF) sequence listings for pending biotechnology patent applications, which were filed in paper form.

Brian P. Yenke

BRIAN P YENKE
PRIMARY EXAMINER

B.P.Y
29 October 2005